

TRANSLATION**PATENT COOPERATION TREATY****PCT****INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference B14367.3 ALP	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/FR2004/050484	International filing date (<i>day/month/year</i>) 05.10.2004	Priority date (<i>day/month/year</i>) 06.10.2003
International Patent Classification (IPC) or national classification and IPC G01R33/05		
Applicant COMMISSARIAT A L'ENERGIE ATOMIQUE		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table><tr><td><input checked="" type="checkbox"/></td><td>Box No. I</td><td>Basis of the report</td></tr><tr><td><input type="checkbox"/></td><td>Box No. II</td><td>Priority</td></tr><tr><td><input type="checkbox"/></td><td>Box No. III</td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td><input type="checkbox"/></td><td>Box No. IV</td><td>Lack of unity of invention</td></tr><tr><td><input checked="" type="checkbox"/></td><td>Box No. V</td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VI</td><td>Certain documents cited</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VII</td><td>Certain defects in the international application</td></tr><tr><td><input type="checkbox"/></td><td>Box No. VIII</td><td>Certain observations on the international application</td></tr></table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report																								
Name and mailing address of the IPEA/EP	Authorized officer																								
Facsimile No.	Telephone No.																								

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
 - ☐ international search (Rule 12.3 and 23.1(b))
 - ☐ publication of the international application (Rule 12.4)
 - ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☐ the international application as originally filed/furnished
 - ☒ the description:
 - pages 1-20 _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the claims:
 - nos. 1-10 _____ as originally filed/furnished
 - nos.* _____ as amended (together with any statement) under Article 19
 - nos.* _____ received by this Authority on _____
 - nos.* _____ received by this Authority on _____
 - ☒ the drawings:
 - sheets 1/7-7/7 _____ as originally filed/furnished
 - sheets* _____ received by this Authority on _____
 - sheets* _____ received by this Authority on _____
 - ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, nos. _____
 - ☐ the drawings, sheets/figs _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-10</u>	YES
	Claims	<u>None</u>	NO
Inventive step (IS)	Claims	<u>None</u>	YES
	Claims	<u>1-10</u>	NO
Industrial applicability (IA)	Claims	<u>1-10</u>	YES
	Claims	<u>None</u>	NO

2. Citations and explanations (Rule 70.7)

1. Reference is made to the following documents:

D1: US 2 743416 A (KELLY JR JOSEPH M)
24 April 1956 (1956-04-24);

D2: KAWAHITO S ET AL: "High-resolution micro-fluxgate sensing elements using closely coupled coil structures" SENSORS AND ACTUATORS A, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 54, no. 1-3, 1 June 1996 (1996-06-01), pages 612-617, XP004077934 ISSN: 0924-4247.

2. INDEPENDENT CLAIM 1

2.1 The present application does not fulfil the requirements set forth in PCT Article 33(1) because the subject matter of claim 1 does not involve an inventive step as defined in PCT Article 33(3).

Document D1, which is considered to be the prior art closest to the subject matter of claim 1,

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

describes (the references between parentheses apply to said document):

- a fluxgate magnetometer (see column 2, lines 54 to 67) including:
 - an open magnetic circuit comprising at least one magnetic core based on a magnetic material that has at least two free ends (column 2, lines 30 to 35);
 - one or more detection coils wound onto said core (figure 5, reference sign 21); and
 - one or more excitation coils wound onto said magnetic core (column 3, lines 27 to 38; figure 5, reference signs 13 and 31) in such a way that all of said magnetic material can reach saturation (column 2, lines 54 to 67).

It follows that that the subject matter of claim 1 differs from that known from D1 in that:

- the magnetometer is a micro-fluxgate magnetometer.

The objective problem that the present invention is intended to solve can therefore be considered to be that of increasing magnetometer sensitivity.

Document D2 (page 612, left-hand column) teaches that a conventional fluxgate sensor can be enhanced when it is produced as a micro-fluxgate sensor and this leads to, *inter alia*, increased sensitivity ("high sensitivity"). As a result, it would be a routine step for a person skilled in the art seeking to solve the stated problem to

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produce the fluxgate sensor as per document D1 in the form of a micro-fluxgate sensor.

3. DEPENDENT CLAIMS 2-10

These claims do not contain any features which, in combination with the features of any one of the claims to which they refer, fulfil the PCT requirements of novelty and inventive step (PCT Article 33(2) and 33(3)).

4. ADDITIONAL OBSERVATIONS

Even though it is known from document D2 that producing a conventional fluxgate sensor as a micro-fluxgate sensor gives rise to immediate advantages, such an embodiment could generate problems of Barkhausen noise. Document D2 teaches that it is advantageous to have uniform saturation of the entire core when seeking to provide greater sensitivity and stability (see D2, page 614, left-hand column, lines 15 to 22). For this reason, the sensor as per document D1 would be particularly suitable for production in the form of a micro-fluxgate sensor.